CLAIMS

1. A method of synthesizing a crystalline material, comprising the steps of:

a) producing seeds (6) of a catalyst adapted to dissolve carbon on a substrate (2) constituted by a first material;

b) growing carbon nanotubes (6) from the seeds (6); and

c) producing a layer of a second material comprising at least one monocrystalline region (12) orientated from a seed (6).

2. A method according to claim 1 in which, during step b), the seeds (6) are orientated in a magnetic field.

3. A method according to one of the preceding claims, in which the first material is an amorphous material.

4. A method according to one of the preceding claims, in which the catalyst comprises a transition metal.

5. A method according to one of the preceding claims, in which the second material is silicon.

6. A method according to one of the preceding claims, in which step c) comprises the following sub-steps:

· c1), during which the second material (10) is deposited in an amorphous form on the substrate (2) and seeds (6) located at the tops of carbon nanotubes (8); then

· c2), during which the second material is crystallized in the solid phase.

7. A method according to one of the preceding claims, in which step a) comprises the following sub-steps:

· a1), during which studs (4) of the second material are produced on the substrate; then

· a2), during which the substrate (2) and the studs (4) are annealed to form seeds (6).

8. A method according to one of claims 1 to 6, in which step a) comprises the following sub-steps:

· a'1), during which a thin film constituted by the second material is deposited on the substrate (2); then

· a'2), during which the substrate (2) and the thin film are annealed to form seeds (6).

9. A method according to one of claims 1 to 6, in which step a) comprises the following sub-steps:

· a"1), during which metal ions are implanted into a thin layer (30);

· a"2), during which the thin layer (30) into which ions have been implanted is annealed to form metallic precipitates (31) from the implanted ions;

· a"3), during which selective attack of the thin layer (30) is carried out to cause metallic precipitates, which will form seeds (6), to appear on the surface.

10. A method according to one of claims 7 to 9 in which, during steps a2), a'2) or a"2), a magnetic field is applied to orientate the seeds (6).

11. A method according to one of claims 1 to 6, in which step a) comprises the following sub-steps:

· a"'1), of depositing a layer of masking resin (40) on the thin layer (30), of producing patterns in the resin (40), and of etching the thin layer (30) at the patterns to form pits (41);

· a"'2), of depositing the second material;

· a"'3), of dissolving resin (40); and

· a"'4), of annealing the thin layer (30) and second material in the pits (41) to form seeds (6).

12. A material comprising:

· a substrate (2) constituted by a first material extending essentially in a plane;

· carbon nanotubes (8) extending longitudinally essentially perpendicular to the plane of the substrate (2) between a free end and an end which is fixed to the substrate (2);

· seeds (6) of a catalyst substantially located near the free end of the carbon nanotubes (8); and

· at least one domain (12) of a second crystallized material orientated from at least one seed (6).